

## FIELD SURVEY OF THE TRUE BUTTERFLIES (PAPILIONOIDEA) OF RHODE ISLAND

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**ABSTRACT.** The survey was undertaken to establish a better understanding of butterfly occurrences in an area previously lacking in published records for many species of the Papilionoidea. All species observed in the field are indigenous to the entire New England region, although some are very selective in choosing their particular habitats. It is interesting to note that many of the species listed are technically records for the state.

Following are the results of my 1983 field studies of the butterflies of Rhode Island. Most occurrences were confirmed by several captures at that particular location (usually followed by release of the specimen), but many sightings were logged on the basis of behavioral characteristics. This task was especially easy in the case of the most common species, while the rarer species were recorded only after a documented capture. Doubtful or questionable sightings were not recorded.

Most sightings were recorded from five primary study areas (Fig. 1) which were visited several times per week on a regular basis throughout the collecting season:

**1. Trestle Trail, Coventry town:** A dismantled railroad bed offering an excellent cross-section of the region's predominant oak forest with several areas of woodland swamp. This proved to be a poor area for butterflies, containing a fair variety of species but generally in very low numbers, totalling 17. Several oak tree species and an undergrowth of various blueberries predominate here, with wildflowers generally lacking.

**2. West Warwick and eastern Coventry towns:** Old established residential/commercial/industrial area interspersed with urban lots, abandoned areas, disturbed fields, and neglected weedy areas. Wildflowers such as asters, daisies, goldenrod, milkweed, parsnip, sunflowers, and loosestrife (in wet areas) abound in these open places and attract an abundance of the more typical weed-field butterfly species, totalling 23.

**3. Arcadia Wildlife Management Area, Exeter:** Extensive areas of oak and pitch pine forest traversed by a network of dirt roads. The area contains several large weed fields. A fair variety of species occurs here, totalling 16; but again, numbers are very low.

**4. Great Swamp Wildlife Management Area, South Kingstown:** Mostly oak forest with areas of mixed forest, extensive freshwater wetland, and several large weed fields. Other unique features such as

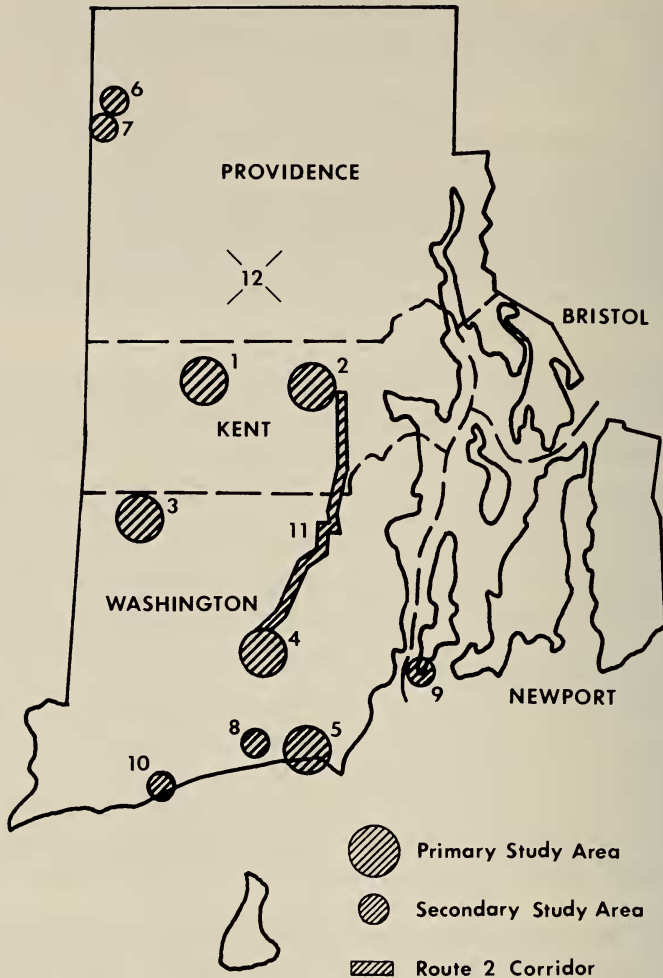


FIG. 1. Study areas for field survey of butterflies of Rhode Island.

sphagnum and cranberry bogs, maple swamp, and at least two stands of Atlantic white cedar are found here. This is perhaps the richest ecological area of the state, containing the largest variety of wildflowers and butterflies, which total 26 species. Many species reach their greatest abundance here.

**5. East Matunuck State Beach, South Kingstown:** A typical east coast beach, with predominant dune grass, rugosa rose thickets, and late-season goldenrods. Not a very rich area for butterflies, except toward the season's end, at which time butterfly numbers seem to in-

crease remarkably. Probably due to the ocean's moderating effect on early frosts experienced inland, one will find butterflies here weeks after they have disappeared in all other locations. Only 10 species were recorded here.

Several secondary study areas were also included in this survey (Fig. 1). These were each visited on an irregular basis although a very thorough count was made on each occasion:

**6. George Washington Wildlife Management Area, Burrillville:** Mixed transition zone forest interspersed with wooded swamps and lakes. A surprisingly poor area for butterflies, with only 3 species sighted. Visited in early August.

**7. Durfee Hill Wildlife Management Area, Gloucester:** An open wetland bordered by mixed forest and a field of goldenrod and joe-pye weed. *Colias* species abundant but few others are present. Only 5 species were sighted in late August.

**8. Trustom Pond Wildlife Refuge, South Kingstown:** Characterized by coastal mixed forest with abundant scrub oak. There are several large weed fields here. 15 species of butterflies were recorded here in late July.

**9. Beavertail State Park, Conanicut Island, Jamestown:** The weed fields above this rocky coastal hillside are characterized by thorny scrub and an abundance of goldenrods and other wildflowers. Pierids abundant with some noticeable gathering of fall migratory species, totalling 19. Visited throughout September.

**10. Ninigret Conservation Area, Charlestown:** Typical east coast barrier beach. Same plants and conditions as in area 5. However, only 6 species were sighted here from late September to early October.

Finally, sightings were recorded along local roads, and generally anywhere, when possible, during my various treks throughout the state:

**11. State Route 2, Warwick City to South Kingstown:** Cutting a cross-sectional corridor through the state's heartland, this was the most thoroughly logged road in my study. Observations were made at various roadside stops and at random locations off the route. This road bisects a variety of environments, from suburban development to woodlands, weedy fields, and agriculture. Observations indicate that butterflies are generally scarce except common pierids. Only 6 species were recorded throughout the year.

**12. Various other places** throughout the state, wherever I travelled, were subject to investigation. None were ever investigated to any degree beyond, perhaps, a one hour collecting stop. A total of 13 species was recorded outside the 11 study areas.

1983 was characterized by abnormal weather patterns. Although blessed by one of the mildest winters on record, the spring was unusu-

ally cool, cloudy, and brought record rainfalls to New England. This had detrimental effects on spring broods, keeping numbers low. The summer was characterized by an extended period of drought and excessive heat, lasting well into September. This probably also spelled ill for summer broods, keeping numbers low except in the case of the common weed-field species which seemed to flourish. The fall started off mildly, but cold weather set in suddenly in mid-October, with some frosts inland.

In general, collecting was very poor in 1983 in Rhode Island, and apparently much of New England as a whole. The most common species appeared in healthy numbers, but less common species and "exotics" were found to be either very low in numbers, rare, or absent altogether.

## RESULTS

Following each description, numbers refer to all study areas (Fig. 1) in which sightings were made, and in parentheses are county listings, abbreviated as follows: **B** = Bristol, **K** = Kent, **N** = Newport, **P** = Providence, **W** = Washington. New county records are in italics. State records are denoted by an asterisk (\*).

*Danaus plexippus plexippus* Linnaeus: Northward migrants first appeared in moderate numbers in mid-vii but became scarce thereafter. Fresh adults appeared in small numbers in milkweed fields during late-viii, but dispersed widely by 1-ix. Population swelled in the southern part of the state from mid-ix to early-x, with gathering along the coast but no obvious migratory movement. Areas 1, 2, 4, 5, 7, 8, 9, 10, 11, 12. (**KNPW**).

*Celastrina laden laden* Cramer: Appeared in great abundance in most localities in iv. Usually found along dirt roads in wooded areas. Form *lucia* dominant early, *marginata* later, and *violacea* dominant toward end of brood in v, with all degrees of intergrades present throughout. I have assembled a complete series of these intergrades, ranging from very heavily-marked *lucia*, through *marginata*, to very light, sharply-marked *violacea*. In contrast, summer form *neglecta* was represented by only a few isolated sightings in vii. I suspect a possible sibling species relationship here. Spring forms *lucia*, *marginata*, *violacea* in areas 1, 2, 3, 4, 11, 12. (**KW**).\* Summer form *neglecta* in areas 1, 2, 12. (**KP**).\*

*Celastrina neglecta-major* Tutt (?): Found mainly at Great Swamp. Originally thought to be a partial second brood of *C. laden*, but evidence suggests that this butterfly is, very likely, a sibling species. Appears toward the end of *C. laden* spring brood in v, when large, bright blue, freshly-emerged males of *neglecta-major* mingle with worn stragglers of *C. laden* form *violacea*. The *neglecta-major* males seemed to disregard *C. laden* females with which they flew, apparently seeking their own kind. The females are very elusive, keeping to the woods and avoiding open spaces. One female was observed flying about a dogwood tree at Great Swamp. Areas 4, 12. (**KW**).\*

*Everes comyntas comyntas* Godart: Three broods. A small brood in early-vi, as the spring form, again appearing in small numbers in early-vii as the summer form. Common only in viii as a full summer brood, with late emergers into early-x. Found mostly in weed fields. Areas 2, 3, 4, 7, 12. (**KPN**).\*

*Incisalia henrici henrici* Grote & Robinson: Appearing in small numbers in early-v in the vicinity of Great Swamp. Found only in association with American holly, never

straying far from this plant, although another reported foodplant, highbush blueberry, is abundant here. Area 4. (W).\*

*Incisalia niphon clarki* Freeman: Represented by one individual captured in early-v in the vicinity of Great Swamp. Found in close proximity to a stand of pitch pine, the reported foodplant. Area 4. (W).\*

*Lycæna phlaeas americana* Harris: Three broods. Spring form common from late-v to early-vi. Summer form in two broods of moderate numbers, throughout July and again in late-viii through ix. Found mostly in weed fields. Areas 1, 2, 3, 4, 8, 9. (KWN).\*

*Satyrrium acadica acadica* Edwards: Represented by one individual taken in mid-vii in West Warwick. This butterfly was sighted near a pond ringed with willows, the reported foodplant. Area 2. (K).\*

*Satyrrium edwardsii* Grote & Robinson: Very few of these butterflies were taken in oak woods in mid-vii. One sighting near the coast in a scrub oak thicket. Areas 1, 8. (KW).

*Satyrrium liparops strigosus* Harris: Very few captures in oak woods, from late-vii to early-viii. Areas 1, 2, 3. (KW).

*Strymon melinus humuli* Harris: Surprisingly only one sighting of this butterfly, which is normally common in the northeast. Captured in West Warwick, late-vii. Area 2. (K).

*Strymon titus titus* Fabricius: Very few captures in oak woods throughout vii. Areas 1, 2, 4. (KW).

*Boloria selene myrinna* Cramer: Only two individuals of this reputedly common species were sighted at Great Swamp in mid-vii. Area 4. (W).

*Limenitis archippus archippus* Cramer: The first brood in v produced very few individuals. An extended summer brood produced individuals in two overlapping cycles, possibly a "split" second brood. Males appeared in moderate numbers at most localities in mid-vii, with females first becoming evident only one week later. Most individuals were well-worn by late-viii, at which time many fresh butterflies appeared. It is with this late emergence that many very dark brownish red individuals appeared at Great Swamp. Worn individuals flew until late-ix. A large number of aberrant forms were sighted throughout the state in 1983. Of the approximately 50 sightings of *archippus* recorded throughout the year, about 34 can be considered within the normal range of variation, with the remainder all of some aberrant nature. Form *lanthanis* was the most common, with 8 sighted or captured. *Lanthanis* varied considerably as well, from very light orange to darker than average ground color. A few specimens have remnant traces of the hindwing band. Five of the dark brownish red variety were observed at Great Swamp. Two specimens were taken which resemble individuals of the southern subspecies *watsonii*, with dark brownish red forewings and pale orange hindwings. Also, one dwarf was sighted in West Warwick, but with normal coloration. Areas 1, 2, 3, 4, 6, 8, 11, 12. (PKW).\*

*Limenitis arthemis astyanax* Fabricius: Generally uncommon, from mid-vi through viii. However, many were observed at Arcadia Wildlife Management Area in mid-viii, where one individual of form *proserpina* was sighted. Another *proserpina*, with the hindwing band greenish, and with a trace white band on the upper forewings, was found in central Coventry. One giant female was spotted, perhaps as large as a swallowtail, for which it was first mistaken. Areas 1, 2, 3, 4, 8, 12. (KW).

*Nymphalis antiopa* Linnaeus: Worn hibernators of the previous fall brood emerged in mass-numbers at Great Swamp in early-iv. These were dark, with the marginal bands appearing whitish and narrow. Numbers decreased sharply by 1-v, with stragglers on the wing until vi. A very small summer brood of 6 was observed elsewhere in the state throughout vii. These were very brightly colored, with wide ochreous marginal bands. No sightings of the fall brood were made anywhere in the state in 1984. Areas 1, 2, 4, 8, 11. (KW).\*

*Phyciodes tharos tharos* Drury: First brood in large numbers throughout vi. Most were typical summer form *morpheus*. While no distinct *marcia* individuals were identified out of hundreds, many *morpheus/marcia* intermediates were evident. *Morpheus* was abundant in the summer brood from mid-vii through viii. A partial third brood of small numbers appeared in mid-ix. These were all *morpheus/marcia* intermediates much like



spring specimens. This species was found generally everywhere in weed fields. Areas 1, 2, 3, 4, 6, 8. (PKW).\*

*Polygonia comma* Harris: Only three sightings of form *harrissi* in widely separated locations in late-viii and early-ix. Found in woodlands near water. Areas 3, 4, 12. (W).\*

*Polygonia interrogationis* Fabricius: Surprisingly, only two sightings were made, both of form *umbrosa*. Found along railroad tracks in West Warwick. Late-vi and early-vii. Area 2. (K).\*

*Junonia coenia* Hübner: A latecomer in late-ix and early-x. Found in small numbers only along the coast. None were of any distinct form, but rather, were intermediate between wet and dry forms. Areas 9, 10. (WN).\*

*Speyeria cybele cybele* Fabricius: Surprisingly few sightings, and only at Great Swamp. Late-vii. Area 4. (W).

*Vanessa atalanta* Linnaeus: Few sightings, most occurring along the coast, but one sighting inland at West Warwick. Two broods, first in vii, again in late-ix. Areas 2, 5, 8, 9. (KNW).\*

*Vanessa cardui* Linnaeus: Northward migrants and/or local hibernators in late-iv, lingering into vi. Summer brood was abundant at inland locations in vii, disappearing by viii. Small numbers reappeared briefly in late-viii, with the final brood appearing in late-ix to early-x, mostly along the coast. Another common weed-field species. Areas 2, 4, 5, 8, 9, 10. (KNW).\*

*Vanessa virginiensis* Drury: An erratic brood sequence was recorded. Small numbers appeared in scattered locations during the first week in v, and again during the second week in vi. Found throughout vii in small numbers but common only during the third week. Small numbers reappeared briefly in late-viii. The final brood appeared during late-ix, when this species became fairly common. Generally found in weed fields. Areas 1, 2, 3, 4, 5, 8, 9, 12. (KNW).\*

*Papilio glaucus glaucus* Linnaeus: Spring "form" *canadensis* was found in very small numbers in the center of the state, in late-iv and early-v. The summer form was recorded as occasional sightings in widely scattered locations, throughout vi to viii. I suspect *canadensis* is possibly a univoltine sibling species, but more research is needed. *Canadensis* in areas 1, 2. (K).\* Summer form in areas 1, 2, 4, 5, 8, 11, 12. (KNW).\*

*Papilio polyxenes asterius* Stoll: Only two spring brood sightings in early-vi. Summer brood appeared in small numbers at Great Swamp in late-viii. Areas 2, 4, 5. (KW).\*

*Papilio troilus troilus* Linnaeus: Spring brood indicated by only one observation in early-vi. Summer form sighted at widely scattered locations from mid-vi through viii, but only common at Great Swamp in early-viii. Areas 1, 2, 3, 4, 12. (KW).\*

*Colias eurytheme* Boisduval: Spring form *ariadne* appeared in small numbers throughout v. Summer form *amphidusa* appeared in small numbers in early-vi. *Amphidusa* was widespread, and common in many areas, throughout vii, but very few were evident in viii. The final brood of *amphidusa* was widespread also from early-ix through x. Several different forms of possible *eurytheme/philodice* hybrids were captured throughout the season. One aberrant yellow female was taken at East Matunuck Beach in mid-vi. This species can almost always be expected in weed fields. Areas 2, 3, 4, 5, 7, 8, 9, 10, 11, 12. (BKNPW).\*

*Colias philodice* Latreille: Possibly the most persistently abundant species in many areas of the state, with three distinct broods of the summer form. Spring form *anthyale* was evident in small numbers only at the onset of the first brood. Common throughout v and early-vi, again throughout vii, with an extended final brood from early-viii through x. Areas 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12. (BKNPW).\*

*Pieris rapae* Linnaeus: The most widespread species in the state, common in almost all open areas but never as abundant as *Colias philodice* in any area. Spring form *metra* in late-iv. The typical form appeared in 4 broods from vi through x, with the final brood being the most common. Areas 1, 2, 3, 4, 5, 7, 9, 10, 11, 12. (BKNPW).\*

*Cercyonis pegala alope* Fabricius: Very few of these were taken in two locations at the western edge of the state in early-viii, with main colonies not being found. The distinctive forewing patch is yellow in this subspecies. Areas 3, 6. (PW).\*

*Cercyonis pegala maritima* Edwards: Abundant in widely scattered colonies from mid-

vii through viii. Never before have I observed any butterfly in such large numbers as this, at Trustom Pond in South Kingstown, where approximately over one hundred individuals were observed along a 30-meter length of trail through a scrub oak thicket. The distinctive forewing patch is orange in this subspecies. *Maritima* also differs from subspecies *alope* by its slightly darker ground color. Differences between these two subspecies can only be safely concluded through large series of specimens. Found in grassy/shrubby areas. Areas 1, 2, 4, 8. (KW).\*

*Megisto cymela cymela* Cramer: Usually found in small numbers in scattered locations, preferring grassy open woods. The first appearance was in early-vi, only at Great Swamp. Absent in late-vi but reappearing elsewhere in moderate numbers during the first week in vii and then in small numbers until early-viii. Areas 1, 2, 3, 4, 5, 8. (KW).\*

*Satyrodes appalachia* Chermock: Two sightings only at Great Swamp in mid-vii. Sighted in woods. Area 4. (W).\*